University of Bahrain

College of Information Technology
Department of Computer Science

ITCS252 Discrete Mathematics
Quiz #1

ID: _____ Name: _____ Section: 04

Q1: Let $U = \{0, 1, 2, \ldots, 9\}$, $A = \{0, 1, 2, 3\}$, $B = \{0, 2, 4\}$, and $C = \{\hat{0}, \hat{3}, 6, 9\}$. Find

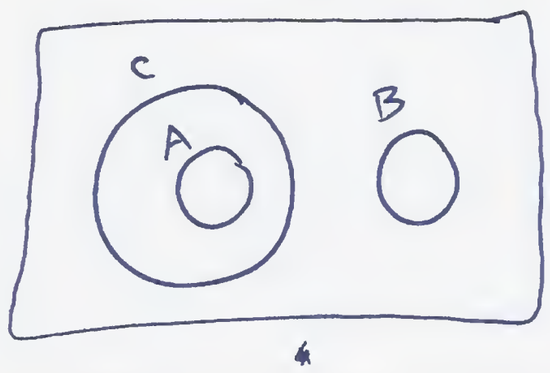
$A \cap B = \{0, 2\}$

$(C - \{0, 3\}) = (A \cap B) \times (C - \{0, 3\}) =$ $\{(0,6), (0,9), (2,6), (2,9)\}$ ✓

$\{6, 9\}$

$A \times \varnothing =$ $\varnothing$ ✓

Q2: Draw Venn Diagram to describe sets A, B, and C that satisfies the given conditions ~~$A \times \varnothing$, $(A \cap B) \times (C - \{0, 3\})$~~.



✓

$A \cap B = \varnothing$
$A \subseteq C$
$C \cap B = \varnothing$

4

Q3: Let $A = \{x \mid x^2 + x = 2\}$ and $B = \{1, -1\}$. Show that $A \neq B$.

$B = \{1, -1\}$

$A = \{-2, 1\}$

$\therefore A \neq B$

$x^2 + x = 2$
$x^2 + x - 2 = 0$
$(x + 2)(x - 1) = 0$
$x = -2$ or $x = 1$

Q4: Let $A = \{1, 2, 3, 4\}, C = \{5, 6, 7, 8\}$, and $B = \{n \mid n \in A \text{ and } n + m = 8 \text{ for some } m \in C\}$. Show that $A \not\subseteq B$.

$\because$ $A = \{1, 2, 3, 4\}$,

$B = \{1, 2, 3\}$ ✓

$\therefore A \not\subseteq B$

✓

A	+ M	= total
1	7	8
2	6	8
3	5	8

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Quiz #2

ID: Name: Section: 04

Q1: Consider the statement: *"Ahmed plays Football or does not play Basketball"*

(a) Write the statement in the form IF-THEN in English.

If Ahmed plays Football, then he does not play Basketball.

p: Ahmed plays football
q: play Basketball

(b) Write the negation of the statement in English.

Ahmed plays Football and plays Basketball.

Q2: Write each of these statements in the form "if p, then q" in English.

(a) Getting that job requires knowing someone who knows the boss.

If you know someone who knows the boss, then you will get that job.

(b) You can go to the Super Bowl unless you can't afford the ticket.

If you afford the ticket, then you can go the super Bowl.

Q3: Write the contrapositive of $|1| < 3$ if $-3 < 1 < 3$.

$-3<1<3 \rightarrow |1|<3$

contrapositive : $\neg q \rightarrow \neg p$

$\neg(|1|<3) \rightarrow \neg(-3<1<3) \equiv$

$|1| > 3 \rightarrow -3 > 1 > 3$

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Quiz #3

ID: **Name:** **Section:**

Q1: Prove using truth table that the following argument is valid.

$$\frac{\begin{array}{l} p \vee q \\ p \rightarrow r \\ q \rightarrow r \end{array}}{\therefore r}$$

promises — conclusion

p	q	r	p∨q	p→r	q→r	r	
T	T	T	T	T	T	T	critical rows
T	T	F	T	F	F	F	
T	F	T	T	T	T	T ✓	
T	F	F	T	F	T	F	
F	T	T	T	T	T	T	
F	T	F	T	T	F	F	
F	F	T	F	T	T	T	
F	F	F	F	T	T	F	

∴ valid